

REMARKS

The Applicants' below-named representative would like to thank Examiner Lois Zheng for the helpful and courteous discussion of the issues in this application held on April 27, 2010. This discussion focused on the differences between the presently claimed invention and the prior art relied upon in the outstanding Office Action. In addition, in order to more clearly distinguish the present invention from the prior art relied upon in the outstanding Office Action, the independent claims now characterize that the measurement of the redox potential is performed on sludge in the connecting pipe between the first and second reactors, and in an outlet pipe of the second reactor. As a result, the measuring instrument of the redox potential can be cleaned more easily and more often compared with the use of a measuring instrument of redox potential provided within the reactors according to the prior art. In addition, the presently claimed invention provides for greater efficiency. The substance of this discussion is summarized and further expanded upon in the following remarks.

The outstanding Office Action includes a single prior art-based rejection. Claims 1-17 stand rejected under 35 U.S.C. §103(a) over German Patent DE 3819020 (DE '020), U.S. Patent No. 5,833,830 to Gonzalez Dominguez et al., U.S. Patent No. 4,917,775 to Rantapuska et al., the Examiner's reference to "admitted prior art," and U.S. Patent No. 6,606,901 to Haanstra et al. This rejection is traversed.

The claimed invention is based on a method and an apparatus for controlling a continuous cobalt removal in conjunction with a zinc preparation process, in which the cobalt removal is performed at least two reactors comprising a first reactor and a second reactor connected in series with a connecting pipe between the first reactor and the second reactor, and an outlet pipe from the second reactor in conjunction with the two reactors, the redox potential and the acidity and/or basicity are measured, and the process variables of the cobalt removal are adjusted toward a the desired direction based on the measurement results, wherein the measurements of the redox potential are performed from the sludge produced in the reactors in the connecting pipe between the first reactor and the second and in the outlet pipe from the second reactor, and the acidity and/or basicity of the reactor solution is determined by means of the BT value, and the measuring instrument of the redox potential is purified at predetermined intervals, and based on the measurement results introduction of zinc powder into the cobalt removal reactor is adjusted.

The prior art relied upon in the outstanding Office Action fails to disclose or suggest provide a redox potential measuring instrument in a connecting pipe between a first reactor and a second reactor and in an outlet pipe from a second reactor according to the presently claimed invention. The Applicants discovered that by providing a redox potential measuring instrument in the connecting pipe and the outlet pipe, the redox potential measuring instruments can be more easily and more consistently cleaned. As a result, the Applicants are able to improve the efficiency of their process compared with the prior art. The Examiner's attention is directed to the above-identified patent application at, for example, page 1, line 30 through page 2, line 20.

Rantapuska et al. disclose a method for measuring electrochemical potential by at least one mineral electrode. The mineral electrode is cleaned by switching onto the electrode a supply voltage differing from the electrochemical balance potential of the electrode. Supply voltage is switched off before starting the measuring operation. In the description of Rantapuska et al. it is not disclosed that the measuring of the electrochemical potential and/or the cleaning of the electrode is carried out in a connecting pipe between two reactors or in an outlet pipe of a reactor. In Figure 2 of Rantapuska et al., there is illustrated only a measuring cell 12, because it is easier and clearer to illustrate the measuring cell separately without a reactor than in connection with the reactor. In fact the measuring cell has been arranged in the reactor vessel. In Figure 3 of Rantapuska et al., there is illustrated only processing of the data received by the measuring cell.

Gonzalez Dominguez et al. disclose a method of electrowinning a metal from an electrolyte comprising the steps of measuring the redox potential of the electrolyte to obtain a measured value, comparing the measured value with a predetermined optimum value and adding a redox agent (e.g. hydrogen peroxide) to the electrolyte to adjust the redox potential of the electrolyte to the optimum value. The electrolyte has predetermined the redox potential optimum zone wherein the amount of undesired chemical products, such as manganese dioxide, is controlled by neutralize or reducing the electrolyte solution. The redox potential is measured from the electrolyte (non-rich solution relating to metal) removed from the electrolysis. The measurement results are introduced into the feeding system into which is introduced fresh electrolyte supplied in the electrolysis, a part of the electrolyte removed from the electrolysis and the redox agent. The method of Gonzalez Dominguez et al. is used clearly in different embodiments than the present invention. In the method of Gonzalez Dominguez et al. it is tried

to prevent the forming of the manganese compounds by means of the indirect adjustment.

Rantapuska et al. describe a method for measuring and adjusting electrochemical potential and/or component content in the process of treating valuable materials. See Rantapuska et al. at column 1, lines 9-15. It is submitted that Rantapuska et al. fail to suggest measuring redox potential in a connecting pipe between two reactors or in an outlet pipe.

Haanstra et al. disclose a process for determining the acidity of a washing solution for removing adhering acid or base from a fibre.

The outstanding Office Action refers to "admitted prior art" in the context of the above-identified patent application at page 2, lines 7-12. See the outstanding Office Action at page 4. This location in the above-identified patent application refers known ways to optimize metal removal. It is well known to measure the redox potential and the pH values of a metal removal mixture inside a precipitation reactor. The Applicants, however, discovered that the redox potential can be measured in a connecting pipe between a first reactor and a second reactor and in an outlet pipe of the second reactor. This is not disclosed or suggested by the prior art. Furthermore, the Applicants discovered that by measuring the redox potential in the connecting pipe and in the outlet pipe, the efficiency of the process can be improved. The redox potential measurement electrodes can be more easily cleaned as a result of their removal for the reactors. As a result, control of the process can be improved.

In view of the above comments, the claimed invention would not have been obvious over the DE '020, Gonzalez Dominguez et al., Rantapuska et al., the Examiner's reference to "admitted prior art," and Haanstra et al. Accordingly, withdrawal of this rejection is requested.

It is believed that this application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,


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